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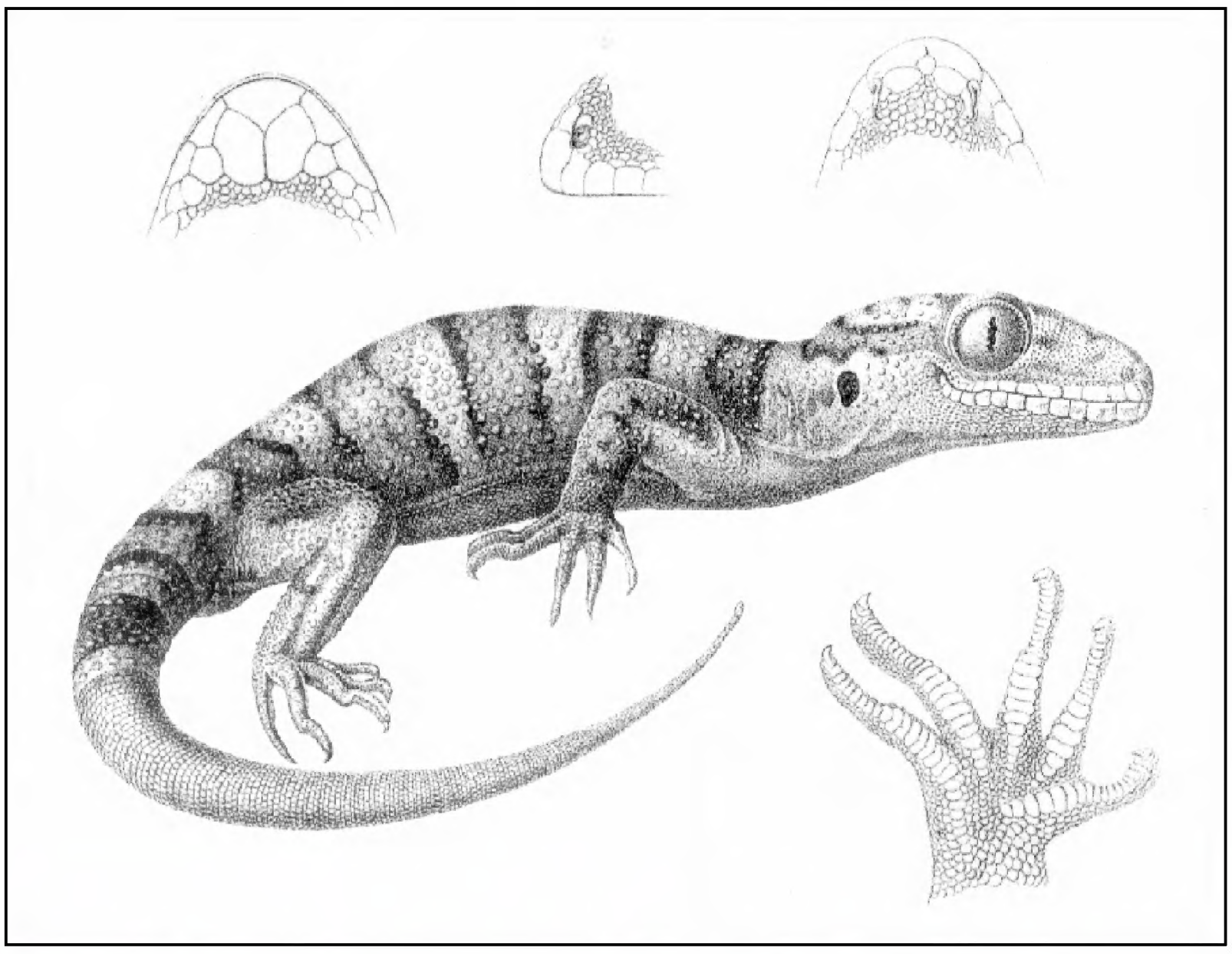

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Body–Ambient Temperature Relationships of the Endemic Chihuahua Fringe-toed Lizard, *Uma paraphygas* . . . . . Cristina García-de la Peña, Héctor Gadsden, Gamaliel Castañeda-Gaytán and Hugo López-Corrujedo 165

Herping in Australia—Field Notes and More. Part 6: Lessons Learnt from Snakes on the Roads . . . . . Raymond Hoser 169

Herping in Australia—Field Notes and More. Part 7: Catching Snakes and Frogs . . . . . Raymond Hoser 171

Book Review: *Stewardship of the Spiny Softshell Turtle* by Scott D. Gillingwater . . . . . David S. Lee 174

HerPET-POURRI . . . . . Ellin Beltz 175

Herpetology 2005 178

Unofficial Minutes of the CHS Board Meeting, August 19, 2005 179

Advertisements 180

Cover: Ring-tailed gecko, *Cyrtodactylus louisiadensis* (as *Gymnodactylus olivii*). Drawing from *Some Reptiles and Batrachians from Australasia* by Samuel Garman. Bulletin of the Museum of Comparative Zoology, Volume 39, Number 1, 1901.

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Body–Ambient Temperature Relationships of the Endemic Chihuahua Fringe-toed Lizard, *Uma paraphygas*

Cristina García-de la Peña[1], Héctor Gadsden[2], Gamaliel Castañeda-Gaytán[1] and Hugo López-Corrujedo[3]

Abstract

We studied the body–ambient temperature relationships of the lizard *Uma paraphygas* in the sand dunes of the Mapimí Biosphere Reserve, Durango, Mexico. The mean body and ambient (substrate and air) temperatures were similar for males and females. The mean body temperature for both sexes pooled was 34.26°C, which is the lowest reported among the five species of the genus *Uma*. Analysis of daily temperature variation showed that body temperature was lower in the morning than in the afternoon, while substrate and air temperatures were higher in the morning than in the afternoon. Body temperature was significantly related to ambient temperatures through the day, but the regression slopes between body and air temperatures were greater than those obtained between body and substrate temperatures.

Keywords: *Uma paraphygas*, body temperature, ambient temperature, temperature relationships.

A challenge facing many lizards is to conduct activities within a body temperature range that optimizes physiological and ethological functions while diminishing mortality risk (Huey and Slatkin, 1976; Avery, 1982). Despite daily variation in thermal environments many lizards manage to maintain relatively constant body temperatures while performing a variety of behavioral and physiological mechanisms (Huey, 1982).

The thermal environment exerts a great influence on the body temperature of lizards in desert habitats (Porter et al., 1973). The dryness and sparse vegetation cover of the Chihuahuan desert presents a thermal challenge to the resident species. In particular, the homogeneous thermal environment characteristic of most dune ecosystems has a strong potential to constrain the way lizards thermoregulate.

Uma paraphygas, the smallest species of its genus (Adest, 1977; Trèpanier and Murphy, 2001), is endemic to the Chihuahuan Desert Province and is considered at risk of extinction in Mexico (SEMARNAT, 2001). However, since 1979 it has been protected at the Reserva de la Biosfera de Mapimí, Durango, Mexico. Until now no data have existed addressing *U. paraphygas* body temperatures as they relate to ambient air and substrate temperatures. Here, we provide information about these parameters for this species and attempt to identify the thermal challenges that *U. paraphygas* faces in its desert environment.

Methodology

During a 1998 population study of *Uma paraphygas* in the sand dunes of the Reserva de la Biosfera de Mapimí (26°29′N, 103°58′W; elev. 1000–1400 m), we obtained ambient (air and substrate) and body temperature data on *U. paraphygas*. Dune vegetation is almost entirely perennial shrubs: whitehorn acacia (*Acacia constricta*), catclaw acacia (*A. greggii*), desert senna (*Cassia covessi*), Texan goatbush (*Castela texana*), ocotillo (*Fouquieria splendens*), creosote bush (*Larrea tridentata*), Berlandier's wolfberry (*Lycium berlandieri*), American threefold (*Trixis californica*) and soaptree yucca (*Yucca elata*).

We conducted 15 days of fieldwork from May through August between 1000 and 1900 h. Individuals of *U. paraphygas* were captured with a noose or by hand on a 2-ha plot. We obtained body temperatures only from lizards captured almost immediately after being sighted. Also, we did not obtain body temperatures on lizards that ran more than 5 m before capture. Each lizard was permanently marked by toe-clipping and given a temporary, easily seen, dorsal acetate mark to avoid recapturing individuals on the same day (Waldschmidt, 1980). We excluded gravid females from this analysis as too few were captured. One body temperature (T_b; to 0.1°C) was obtained for each lizard with a rapid-reading cloacal thermometer on each day. Data were taken within 10 s of capture to avoid changes in T_b that might result from manipulation. Gender was identified by the presence of large postanal scales or everted hemipenes in males. We measured snout–vent length (SVL) to the nearest mm using a flexible ruler and body weight (W) to the nearest 0.1 g with a Pesola™ spring scale. Lizards were released at the point of initial sighting following processing. Air temperature (T_a; 15 cm above the sand surface to the nearest 0.1°C) was registered using a thermo-hygrometer. Substrate temperature (T_s; in contact with the sand surface to the nearest 0.1°C) was registered through a flat bulb thermometer. Both operational temperatures were taken immediately after capture at the exact place in which the lizards were first sighted.

Kolmogorov-Smirnov goodness of fit tests revealed that the

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data for SVL, W, T_b, T_s and T_a were compatible with the assumption that all these variables are normally distributed, so we used one-way analysis of variance (ANOVA) to compare means of SVL and W between females and males. An analysis of covariance (ANCOVA: SVL and W as covariates) was applied to compare mean T_b between females and males. To compare mean T_s and T_a between females and males two one-way ANOVAs were used. To identify differences among T_b, T_s and T_a at each hour of day, we used one-way ANOVAs and regressions between T_b and each of T_s and T_a. We assumed all tests to be significant at $\alpha = 0.05$; measurements are reported as mean ± SE.

Results

Mean SVL for females was 60.9 ± 0.5 mm (n = 140; range = 33–72 mm) and for males 70.4 ± 1.0 mm (n = 99; range = 37–89 mm. The mean W for females was 6.5 ± 0.1 g (n = 140; range = 2.5–11 g) and for males 10.1 ± 0.4 g (n = 99; range = 1.4–19 g). Females were significantly smaller than males in length ($F_{1,237} = 74.50$, $P = 0.0001$) and body weight ($F_{1,237} = 83.61$, $P = 0.0001$). The mean T_bs for females (33.2 ± 0.2°C) and males (34.7 ± 0.2°C) were not significantly different (ANCOVA, SVL and W as covariates: $F_{1,235} = 0.23$, $P = 0.62$) and the mean T_b for both sexes pooled was 34.2 ± 0.1°C (n = 239, range = 26–41°C). The mean T_s selected for females (34.9 ± 0.5°C) was not significantly different than T_s selected for males (36.3 ± 0.6°C), $F_{1,237} = 4.95$, $P = 0.27$; and the mean T_s selected for both sexes pooled was 35.5 ± 0.4°C (n = 239, range = 22–62°C). The mean T_a selected for females (30.6 ± 0.3°C) was not significantly different than T_a selected for males (31.7 ± 0.4°C), $F_{1,237} = 4.48$, $P = 0.35$; and the mean T_a selected for both sexes pooled was 31.0 ± 0.2°C (n = 239, range = 20–43°C).

The variations of T_b, T_s and T_a for each hour of day are shown in Figure 1. There were no lizards observed between 1400 and 1600 h. We analyzed separately two periods of day: morning (1000 to 1400 h) and afternoon (1600 to 1900 h). In the morning there was significant difference for T_b ($F_{3,140} = 6.03$, $P = 0.001$), T_s ($F_{3,140} = 16.55$, $P = 0.0001$) and T_a ($F_{3,140} = 11.44$, $P = 0.0001$). A Tukey test for each temperature variable indicates that T_b, T_s and T_a were significantly lower at 1000 h, and from 1100 to 1300 h remain at similar values. The regression analysis between T_b and each of T_s and T_a at this period of day were significant (T_b - T_s: $R^2 = 0.23$, $F_{1,142} = 42.7$, $P = 0.0001$, $T_b = 28.5 + 0.16T_s$; T_b - T_a: $R^2 = 0.24$, $F_{1,142} = 46.9$, $P = 0.0001$, $T_b = 25.2 + 0.29T_a$). In the afternoon there were no significant differences among each hour for T_b ($F_{3,39} = 0.49$, $P = 0.68$) and T_a ($F_{3,39} = 0.44$, $P = 0.72$). T_s showed significant difference ($F_{3,39} = 5.97$, $P = 0.002$) and a Tukey test indicates that T_s was lower at 1900 h. The regression analysis between T_b and each of T_s and T_a at this period of day were significant (T_b - T_s: $R^2 = 0.12$, $F_{1,41} = 5.63$, $P = 0.022$, $T_b = 27.3 + 0.24T_s$; T_b - T_a: $R^2 = 0.48$, $F_{1,41} = 38.7$, $P = 0.0001$, $T_b = 13.84 + 0.65T_a$).

The lizards' mean body temperature in the morning (34.4± 0.1°C, range = 27–41°C) was lower than in the afternoon (36.7 ± 0.3°C, range = 32–41°C), $F_{1,183} = 32.0$, $P = 0.0001$. Inversely, mean T_s and T_a were higher in the morning (T_s: 38.8 ± 0.5°C, range = 32–49°C; T_a: 35.1 ± 0.4°C, range = 29–39°C) than in the afternoon (T_s: 36.4 ± 0.5°C, range = 24.5–62°C; T_a: 31.0 ± 0.3°C, range = 23–43°C; $F_{1,183} = 5.17$, $P = 0.02$ and $F_{1,183} = 44.12$, $P = 0.0001$, respectively).

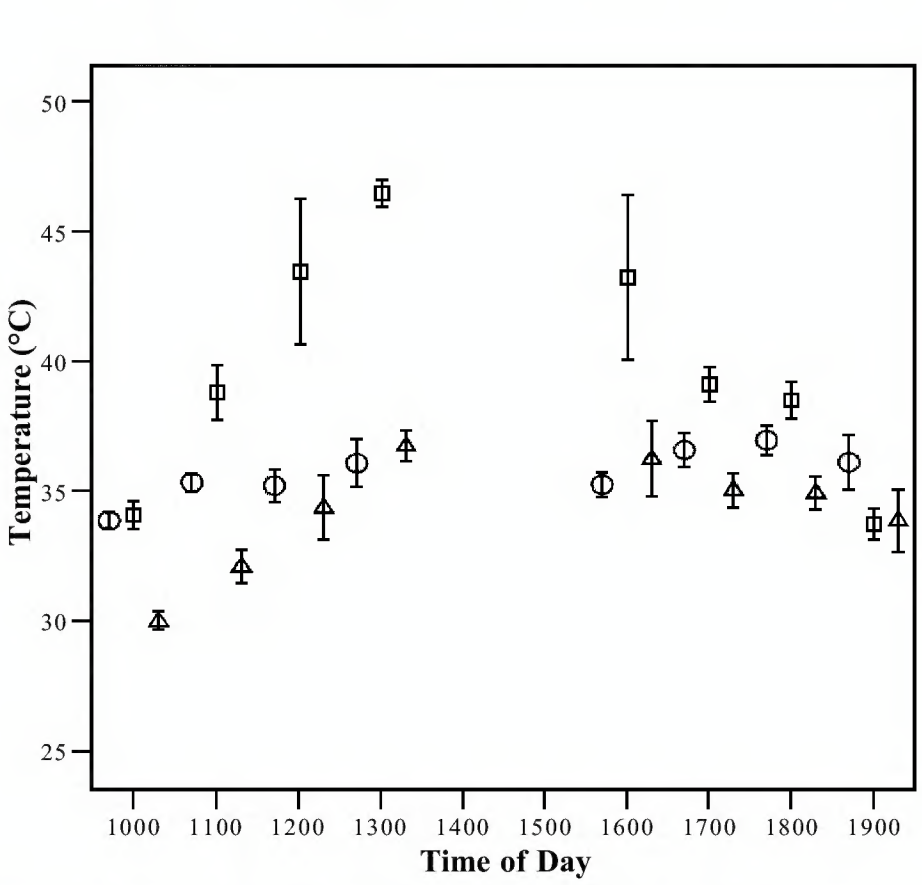

Figure 1. Hourly means of *Uma paraphygas* body temperature (circles), substrate temperature (rectangles) and air temperatures (triangles). Bars represent ± SE.

Discussion

The mean T_b of *U. paraphygas* obtained in this study is the lowest body temperature value reported in the genus *Uma* (see Table 1). *Uma paraphygas* is the smallest in its genus and therefore it has a greater surface area to volume ratio than the other species of *Uma* and this means a probable lower body temperature (Heatwole and Taylor, 1987), see Table 1. On the other hand, *U. paraphygas* density is the highest registered in its genus with 24 ind/ha (Castañeda-Gaytán et al., 2003). This could allow a high intraspecific competition which can restrain the use of space-thermal resources that these organisms need (Huey, 1982). The result for *U. paraphygas* could be a lower body temperature than the other *Uma*. However, this hypothesis needs to be probed through spatial and thermal resource partition studies in several dune patches inhabited by *Uma* at varying densities (Norris, 1958; Trépanier and Murphy, 2001; Gadsden et al., 2001). Additional data are needed to understand the factors that influence interspecific variation of T_b in the genus *Uma* from a phylogenetic approach (Garland and Adolph, 1991).

Though males of *U. paraphygas* were larger and heavier than females, mean body temperatures did not differ significantly between the sexes and both sexes preferred similar substrate and air temperatures as is the case in other species of phrynosomatids (Smith and Ballinger, 1994). Some thermoregulation studies (Peterson, 1987; Christian and Weavers, 1996) indicate that many reptiles maintain relatively constant T_bs during daily activity. In this study *U. paraphygas* showed a low body temperature at 1000 h related to the low ambient temperatures at this hour of day. In the next hours, substrate

Table 1. Mean body temperature and mean snout–vent length reported for five species of the genus *Uma*. Data sources in parentheses.

Species	Mean body temperature	Mean snout–vent length
Uma inornata	38.0°C (Mayhew, 1964)	91.0 mm (Muth and Fisher, 1991)
Uma notata	37.9°C (Mayhew, 1964)	83.8 mm (Turner and Schwalbe, 1998)
Uma scoparia	37.5°C (Licht and Basu, 1967)	90.0 mm (Mayhew, 1966)
Uma exsul	35.0°C (García-de la Peña et al., 2005)	74.2 mm (Gadsden et al., 2001)
Uma paraphygas	34.2°C (present study)	64.5 mm (Castañeda-Gaytán et al., 2003)

temperatures rise continuously but body temperatures remain relatively constant. In the afternoon, the T_b values were higher than in the morning but were similar each other in this period of day. This means that individuals of this species are able to maintain their body temperatures within a relatively narrow range by behavioral or physiological means (Waldschmidt, 1980; Huey, 1982).

Turner and Schwalbe (1998) reported that surface temperature was (on average) 2°C higher than the corresponding body temperatures of *Uma notata* at the Mohawk Dunes, Arizona, while air temperatures were lower than body temperatures. They agree that these differences reveal the effectiveness of the lizard's behavioral thermoregulation process in achieving and maintaining a preferred body temperature. In this study we found for *U. paraphygas* that T_s averaged 2.09°C higher than T_b, and T_a were lower than T_b at an average of 2.91°C which are similar to the *U. notata* observations.

Following Huey (1982), thermoregulation is indicated by a slope near 0 and thermoconformity by a slope near 1 when T_b is compared to T_a. In this study we observed that in the morning there was a slope of 0.29, which indicate a thermoregulatory behavior. On the other hand, in the afternoon there was calculated a slope of 0.65, which indicate that at this period of day *U. paraphygas* could tend to act as a thermoconformer. Similar slopes were observed for other lizard species of the southwestern deserts of North America. For example, Middendorf and Simon (1988) reported a slope of 0.40 for *Sceloporus jarrovii*, Smith et al. (1993) calculated a slope of 0.23 for *Sceloporus scalaris* and Smith and Ballinger (1995) obtained a slope of 0.30 for *Urosaurus ornatus*. However, the use of biophysical null models is necessary to obtain definitive conclusions about *U. paraphygas* thermal relationships.

Acknowledgments

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Herping in Australia—Field Notes and More
Part 6: Lessons Learnt from Snakes on the Roads

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Taking a Leaf from Another Herper's Book

Ron Sayers is a name familiar to some of this magazine's older readers. He was a prominent name in North American herpetology in the 1960s and 1970s. That was no mean feat considering he also had to maintain and keep at least ten kids from two marriages. He told me about not knowing what caused it (having kids) and said something else about bad TV reception. I think he was joking.

I recall spending a hot night with Ron Sayers on 26 February 1978 in search of herps on West Head Road. We found a large female (nongravid) gray death adder that night. But that may not have been the most important feature of the night. As we talked, I was able to pick his brain for the wisdom many years of chasing herps had given him.

Having spent his formative years in the North American bush, he told me about his forays in search of rattlesnakes (*Crotalus* spp.) and the like. I also asked him about other aspects of snake biology like denning, which is not so common here in Australia. Sayers noted that if he drove along a road during fall and saw a number of DOR ("Dead on Road") rattlesnakes in a given area he'd always take note of a few key elements. These were which way the snakes were facing when hit (if that could be determined) and if there were any good south facing slopes and rock outcrops nearby. You see this was often indicative of a den. And yes, Ron said that by this method he was able to find quite a few hitherto unknown denning sites.

Later that summer, or perhaps more accurately I should state, at the end of that summer, there was yet another night hot enough for me to go snake hunting in Kurringai Chase. It seems to be the case that at the end of the warmer months, snake activity tends to drop off, even if the hot weather lasts slightly longer than normal. It seems that the snakes are wise to the change of the seasons and get ready for the cooler months almost regardless of the day to day variations in weather conditions.

And so it was on this night. The weather was hot, and everything else was also A1 for the snakes. Air pressure falling and no moon in sight. But all I found this night was a single young diamond python crossing the Coal and Candle Creek Road, just near the top of the hill, where it meets the West Head Road.

Now I'm so familiar with the area, that I know every twist and turn on these roads and also have a good inkling of the habitat adjacent to these roads. A few months later and in the depths of the mild Sydney winter I returned to this very spot and saw that the snake had been crossing at a spot where the road made a shallow cutting through the sandstone escarpment. On the high side of the road there was a cutting about 2 meters high, that happened to be facing the afternoon sun (a northwest aspect).

But even more significantly I noticed that the rock was flaking off into large slabs. I decided to lift these to see what hid underneath. Within minutes I'd caught four young diamond pythons. Three were from the previous summer's breeding, while one was of the size class indicating that it was a year older. And so even back as far as 1978, it became evident that diamond pythons (juveniles at least) were actively seeking out warmer overwintering spots.

Going through the earlier records of both myself and my colleagues, we soon realized that this case I'd just had with the diamond pythons wasn't a one off. Another friend found three juveniles in a similar situation at nearby Belrose a few years earlier. These snakes were hiding under rocks on a northwest facing rock outcrop in winter as well. And yes, by using this new-found knowledge, the finding of diamond pythons suddenly became that much easier.

The quest for northwest facing slopes by diamond pythons also explained another anomaly I'd noticed over previous years. This was the huge number of young diamond pythons getting run over on Tumble Down Dick Hill on Mona Vale Road. Mona Vale Road cuts from the Sydney suburb of St. Ives, through the bushy suburb of Terrey Hills to the beachside suburb of Mona Vale. While there are some houses along most of the road, in the area from Tumble Down Dick Hill (near the entrance to McCarr's Creek Road, Kurringai Chase), the road actually passes through bushland along the top of a well-defined ridge.

Tumble Down Dick Hill is the highest point in the area and as such it was acting as a funnel for diamond pythons seeking a sunny site to spend winter. The main road runs along the east side of the top of the hill and as the young pythons were continuing their quest for the higher ground with a northwest aspect, they were being forced to cross the busy road. And yes, as a result, most were ending up splatted on the road instead.

More Snakes Seeking Winter Warmth

The same theory explained why some houses in Melbourne were always finding themselves awash with snakes in the autumn months. Melbourne is another 889 km southwest of Sydney by road and as a result is an average of 3–5°C cooler most of the time. This makes the quest for heat by herps that much more critical.

As a snake-removalist, I soon noted a cluster of houses in the suburb of Warranwood got far more calls to remove snakes than did others in the district. The local terrain simply said it

all. The area was hilly and semi-rural with mainly open grazing country and small paddocks, punctuated by old sheds, tin and other rubbish as well as fallen logs and a smattering of rocks and concrete blocks. Ditches also had thick vegetation allowing reptiles plenty of hiding spots. This was not unique for the district, but what was relatively unusual was the gully that ran up to this group of properties. It made the local slope face northwest and as a result the area got the full afternoon sunlight every day.

The snake species in question was the lowland copperhead (*Austrelaps superbus*) and as every herper knows, these snakes frequent swampy areas where they tend to feed mainly on frogs. But come winter, they seem to seek out warmer spots to hide and hence the quest for higher ground. And so in this area we had the seasonal shift from the gullies to the residential back gardens on the sunny northwest slope.

Across Melbourne, I saw the same scenario with some eastern brown snakes (*Pseudonaja textilis*) at Thomastown hiding behind a north-facing retaining wall at the back of a large factory. The concrete bricks that made the wall ranged up to 15 cm thick, which allowed the snakes to effectively bask and remain under cover. And once again the snakes just couldn't miss the site as they moved up the northwest facing slope in the autumn.

The Microhabitat of Death Adders

Now death adders (genus *Acanthophis*) are strange snakes. In theory they hide in and amongst leaf litter, particularly in between rock outcrops and near watercourses where they lie in wait for their prey to come along. By caudal luring, more commonly known as "tail twitching," these snakes fool their potential prey into seizing for what is thought to be an insect, and instead finding themselves seized by a pair of snake jaws and fangs.

But in spite of this knowledge about death adders, they are about the only Australian species I've been unable to find during the day. And yes, I spent many years trying to find these snakes by day but without success. Sure others have done this, but I never could.

For example I received a number of reports of death adders being found by day in a gorge in the lower Blue Mountains. The exact spot was Fitzgerald Creek, near Glenbrook, near where it runs into the Nepean River. In fact I inherited three adders caught from here, all by day and was keen to find some myself. A day of searching intensively here in the exact spot that the other three were caught failed to reveal any. Sure I found other sandstone region herpetofauna, but no death adders.

That was way back in the early 1980s. And yes, since then there have been quite a few death adders caught around this location during the day. Most of the captive born death adders I currently hold (as of 2002) actually derive from parents sourced from here.

Then there were the reports of adders from Crossroads in Sydney's north. This bushland area forms a peninsula in the watercourse of the lower reaches of the Hawkesbury River, more or less to the west of Berowa. I went there with a rake and after a day's work of raking leaves, I again came home empty-handed.

Another herper Craig Bennett found three death adders in the vicinity of Middle Harbour Creek, to the East of St Ives, all by day. One was a gray subadult male seen in the open. It died of unknown causes shortly after capture. Another was a monster gray female found resting under an overhang near the creek. It was a total length of 86.5 cm and had just eaten an oversized eastern water dragon (*Physignathus lesueurii*) of some 80 cm total length. Thus the lizard was effectively the same size as the snake. The tail of the lizard was still hanging out of the snake's mouth, the snake being unable to swallow any further. Within days the snake was dead, being both unable to digest or regurgitate the lizard (see Hoser, 1981).

Prior to this I had been with Craig Bennett (on 6 August 1977) when he found another (the third) death adder in bushland adjacent to the same creek. It was a recently born (21 cm total length) red female. The snake had been hiding under a slight overhang under a small rock (18 × 60 × 18 cm high), meaning that it was invisible unless the rock was lifted. Craig had lifted the rock and found it.

It took me 14 months to raise to adult size (58 cm). Elsewhere, I've hunted by day for death adders (of various species) throughout all the right parts of Queensland by day, ditto for the Northern Territory, including hot-spots like Barrow Creek, and even in good parts of the Pilbara.

Have I ever seen any? No, not a trace. Not even a slough. But change the picture to night drives and I've found heaps. Not just in Sydney and Western Australia, but elsewhere as well. In the right areas, death adders (*Acanthophis* spp.) suddenly become one of the more commonly seen species!

And so this poses a series of interesting questions. Just where do these snakes go during the day? And what exactly is their preferred microhabitat?

I had a call once from fellow herper Neil Davie who was asking me such questions about death adders on behalf of one of his mates who wanted to find some and then keep them as pets. The conversation went roughly along the lines as follows:

Neil – Where do you usually find Death Adders?
Hoser – West Head Road.
Neil – I mean what kid of habitat?
Hoser – Roads.
Neil – Be more specific please.
Hoser – Those long black things you drive your car on.
Neil – Funny, funny. No Raymond. Please tell me their preferred microhabitat. Where exactly they're found.
Hoser – Tarmac. Bitumen, get the drift.
Neil – But where do they actually live?
Hoser – I've never seen them anywhere else.

The Taxonomy of Death Adders

I don't want to get bogged down on taxonomy in this arti-

cle, but in my formative years as a herper I took a strong interest in these snakes. And while I was unable to find any by day and at that stage wasn't into driving along roads at night to find these snakes, I still had some knowledge of them. In fact, based on the large number of preserved specimens I had available to me, I was even able to write a preliminary diagnosis for the genus *Acanthophis*. It read as follows:

> "Genus *Acanthophis*. Allegedly one of the family Elapidae (fixed, front-fanged venomous land snakes). A medium sized and thick-set snake. It cannot possibly be confused with any other Australian snake because of its build, a ratlike tail that terminates in a spine and the fact that all specimens known seem to lack a head."

Yes, the latter part was true! You see of all the snakes that occurred around Sydney, there was none as good at having its head chopped off as a death adder. They are short, stout and slow-moving. Slow enough moving that anyone can get a good go at chopping their head off with a shovel. And so it was. Nearly all the first ten death adders I saw lacked heads!

Twenty to thirty years ago, to have an interest in snakes was a freakish thing. Even now, it's nowhere near as mainstream to have an interest in snakes in Australia as it is in the United States. And so, because I was unusual in my obsession with snakes, I soon became known around Sydney as "the snakeman."

Okay, so Australians aren't noted for their originality in naming people! And yes, whenever there was a snake that crawled into someone's back garden, invariably I'd get the call on the phone to remove it. And that's when I started to get all the headless death adders. You see, these people just couldn't wait for you to get to their house and so they took to chopping off the death adder's head instead.

The other species that tended to turn up, like eastern brown snakes (*Pseudonaja textilis*), red-bellied black snakes (*Pseudechis porphyriacus*) and the like were usually smart enough to duck into a pile of wood or similar cover and escape or hide—at least until I arrived with my snake-finding dog.

But the death adders were never in the race. Slow and clumsy in terms of their movement, they invariably got clobbered. Then one day came a call from someone with a "massive death adder" in their yard. I told them straight "keep your eyes fixed on the snake, don't lose it, don't kill it, for Pete's sake don't give it the shovel, I'm coming over now!" Racing across to Belrose, I arrived to find about a hundred people circling something in the middle of a lawn. Hooray! I had an intact death adder . . . or so I thought. It turned out to be a nasty one-meter tiger snake (*Notechis scutatus*).

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Herping in Australia—Field Notes and More
Part 7: Catching Snakes and Frogs

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Dogs and Humans

Yes, I had this snake and lizard finding dog. His name was Freud. Named after the famous psychologist, my parents got to choose the name because they thought the dog was intelligent. It was a cross Dachshund/Doberman, or so it looked. We got it as a six-month-old (estimated) stray on a train one day when we were going to see a movie.

The dog soon took to his true vocation, yes, finding herps, and there began a rewarding nine-year relationship, which not only took us all around Sydney and its environs, but over the years most parts of southeast Australia and even the Top End.

The dog started out finding lizards mainly, but soon graduated to rabbits, foxes, cows, kangaroos, echidnas and just about anything else that moved. The nonherps were at times our biggest drawback. You see when rabbits were thick on the ground, the dog would spend the day chasing them and not finding much herp. As the dog got older, he got better at finding creatures and after a few years started to find snakes.

At first it was mainly green tree snakes (*Dendrelaphis punctulatus*). Now these are not a particularly common species around Sydney as compared to many others, but the dog was finding lots of these and not much else. Presumably this had something to do with a stronger scent or something like that. This I assume also explained why the dog was better at finding lizards than snakes. Perhaps the lizards gave off a stronger scent.

The next most commonly found snakes by the dog were red-bellied blacks (*Pseudechis porphyriacus*). Again that may have had something to do with their scent. In fact it was one of these that eventually led to his demise. At nine years old he was getting a bit slower, but his downfall was his becoming increasingly bold. Sometimes he'd not only find a reptile, but he'd also attack it. This was relatively rare. You see the dog would chase the reptile down a hole or under a rock and start

to dig it up. We'd catch up and then we'd simply tie him up immediately nearby while we then dug out the reptile or lifted the rock.

However on a warm sunny day during Easter 1978, the dog was too fast and too bold. I and another herper, John Scanlon, were in thick scrub near Deep Creek, Oxford Falls (Garrigal National Park, about 23 km north of the Sydney Central Business District), when my dog started barking. Knowing this was the message "I've found something", John and I bashed through the scrub to catch up with him.

We reached him within seconds, only to find him lying unconscious on a rock outcrop with the rear end of a 1.5-meter red-bellied black snake lying next to him. The dog had been bitten numerous times on the snout, obviously while he was chewing the snake in half. The front half of the snake had amazingly made off into the scrub. In spite of the fact that it probably went no more than a few feet away, the vegetation was so thick that we never found it. The dog died an agonizing death over the next hour. And as it happened, we couldn't have chosen a more remote piece of bushland so close to Sydney for such a thing to happen. We were at least an hour's hike though thick scrub from the nearest road.

A few years later and a few kilometers away, I and another two herpers were again looking for snakes when we stumbled upon a house in the middle of the bush. A man in his fifties walked out and asked us what we were doing. My mates told him we were looking for snakes, to which the man replied "Oh, you won't find any here. I've been here for thirty years and I've never seen any!"

As my friends continued talking my basic herper instincts made me lift a sheet of tin just a few feet away and by the side of the house. And yes, a beautiful 1.5-meter red-bellied black snake was lying underneath just waiting to be caught. The man in his fifties had to eat his words.

But getting back to the dog that found snakes, I once met a herper who was nearly as good. Or at least he seemed to think so. Robert Croft (they called him Hare, because he ran so fast) took me chasing reptiles in the bush at the top end of Warrimoo Avenue, St. Ives. This is in Kurringai Chase and we were scouring the rock outcrops along the west-facing slopes of the Western Branch of Cowan Creek (between the creek and the Warrimoo Walking Track).

Croft was showing me how common brown tree snakes (*Boiga irregularis*) were in this area during the winter months. It was a typical Sydney winter's day. Cool and sunny. And for those who don't know, most herps in Sydney tend to find a resting place for winter and then stay put for the coldest months (the period from mid-May to at least mid-August). And this is when people like myself can simply come along and lift the sandstone rocks and find them.

Getting back to this particular area, I must say that as far as snakes went, the bush didn't exactly reek of herp. To me it seemed a bit dark and overgrown and while the habitat was rocky, it wasn't as rocky as many other areas in Kurringai Chase or elsewhere around Sydney. But the snakes obviously didn't mind. We found several within a few hours and this was fairly normal for the area. Included were brown tree snakes (all found in crevices), green tree snakes (under rocks [rock on rock] or in crevices) and yellow-faced whip snakes (*Demansia psammophis*) (under rock on rock or rock on dirt). Then of course we found the other staples of the Sydney sandstone ridge habitat, like Lesueur's geckos (*Oedura lesueurii*), copper-tailed skinks (*Ctenotus taeniolatus*) and red-crowned toadlets (*Pseudophryne australis*).

Other species reasonably common to the area, but not found by us were diamond pythons (*Morelia spilota*) and small-eyed snakes (*Rhinoplocephalus nigrescens*), (I'd caught both in North Turramurra, one suburb to the north, and St. Ives Chase, one to the East).

But what I found most notable about this particular day was when walking through the scrub, Croft exclaimed, "I smell green tree snake!" He started to sniff profusely and follow the smell. Within minutes he'd wandered through the bush to a rock crevice where the snake was resting. He later recalled that he often found green tree snakes this way. But he went on to say that these were the only snakes with a scent strong enough for him to track. And that was obviously why my dog also found these snakes the easiest to find.

Keep Australia Ugly

When I was a child, people dumped their rubbish everywhere. It was great! Now you have these do-gooder antilitter campaigns and they really are making it hard for the herps and the herpers.

When I was a child a fellow herper by the name of Robert Croft (whom I just talked about) came to my house and told me of the seven alpine blotched bluetongue lizards (*Tiliqua nigrolutea*) that he'd found at Katoomba in the Blue Mountains about 100 km west of Sydney. I assume most readers are familiar with how beautiful these lizards are, so it wasn't unnatural for me to ask Robert more about his find.

It turned out that he'd been on a day trip to see the "Three Sisters." This is a rock formation at the edge of the plateau, which draws tourists like flies to you-know-what. On the way home he'd stopped at a vacant plot of land and lifted numerous sheets of tin. That's where he found the lizards.

At the time, I'd never seen blotched bluetongues so close to Sydney, only ever having seen them at Oberon, which was twice as far away and hidden out on a back road. By contrast Katoomba was dead easy. The next weekend I and a mate caught a train along the main western train line and alighted at Katoomba Railway station.

We walked off the train and into the township to the south side of the railway track. Katoomba was then one of those relatively poor country towns, and was characterized by old and shabby houses, interspersed with long-abandoned housing lots that had been effectively left to rot in a mixture of weedy grass and general household rubbish dumped by the local residents.

Within minutes we were in one such vacant lot lifting up

cardboard boxes, sheets of tin and anything else we could find. In those days I was, I suppose, just half a herper because I ignored the numerous small brown skinks I saw, which I now know of as *Leiolopisma entrecasteauxii*.

But another skink I didn't ignore was what we knew then as the she-oak skinks (*Cyclodomorphus casuarinae*). We soon found a few of these distant relatives of the bluetongues (*Tiliqua* spp.) that apparently mimic young brown snakes (*Pseudonaja textilis*) with dark markings on their head and nape. Having reduced limbs, they move about like a snake, and even flicker their broad fleshy tongue like that of a snake.

That was another reptile I had never caught before. As it happens they are common throughout the upper Blue Mountains. (In 1983 Wells and Wellington renamed the local Blue Mountains variant *Cyclodomorphus michaeli*. The designation was effectively ignored by Australian herpetologists until Shea (1995) not only confirmed the designation via a more detailed study, but further subdivided *casuarinae* as then known into three geographically distinct taxa by adding another new species *C. praealtus* from the Snowy Mountains region of New South Wales.)

Shortly thereafter we found our first alpine blotched bluetongue and by the end of the day we'd found over 20 hiding under tin and other rubbish on vacant housing lots. By that stage we'd managed to walk to Leura train station (one stop closer to Sydney), and thus we caught the train home.

The irony is that in later herping trips in the bush in the upper Blue Mountains, we never saw any blotched bluetongues or she-oak skinks, and the small *Leiolopisma entrecasteauxii* were also relatively uncommon.

Another species known from the Blue Mountains is the pink-tongued skink (*Tiliqua gerrardi*). This is a bluetongue-sized lizard, but as the name suggests, adults usually have a pink tongue. They occur in wetter forested habitats from about Gosford (60 km north of Sydney), to Queensland and along the Queensland coast.

However there is an apparently isolated population at Springwood in the mid Blue Mountains, which is way further south and west than otherwise known for the species. The habitat there is largely wet forest, so it fits the bill for the species, even if the location seems to be a bit out.

The first I heard of the species in Springwood was while attending an Australian Herpetological Society meeting at the Australian Museum in Sydney. The society had just had a field trip to some bushland near Springwood and about the only herp of note that they'd seen was a single adult pink-tongued skink found in a rock crevice.

I took a punt and used the household rubbish theory for the pink-tongued skinks. I soon found myself standing at Springwood railway station.

Springwood wasn't quite like Katoomba. Quite the opposite in fact. The area was dominated by newer houses and clean, manicured lawns. There didn't even appear to be any vacant lots between houses as was common in the streets of Katoomba. I wanted rubbish and needed it fast! Thankfully there was a railway line and where you find these there always other nice things for herpers—like railway sleepers! Within a few hours I'd found seven pink-tongued skinks in land adjacent to the railway line. All were found sheltering under man-made rubbish.

I felt pretty good. After all, about twenty herpers managed one animal in the bush from Springwood, while I got seven just by hitting the rubbish!

Just a few years ago I had the same sort of thing happen here in Victoria. Rob Valentic and I went in search of the Victorian swamp skink (*Egernia coventryi*). He'd read the books and knew where to look—*Melaleuca* swamps. We went to the right place—Tootgarook Swamp, on the Mornington Peninsula. We'd both read a paper by Mike Taylor on this very colony.

Now don't get me wrong, Rob's a good herper, but I had it all over him this time. He checked out the swamp and the *Melaleuca* trees. I cheated. I went to the rubbish tip next door. And yes, I got the lizard first! Where was it? Under a slab of concrete of course. Rob complained, "But the books don't say that." I replied. "My book always says check out the local rubbish tip first!"

Which gets me back to Katoomba and many other places for that matter. In 1999 I was back there seeing a few friends and I decided to take a poke around the town. I was shocked with what I saw. The vacant lots were still there. But the overgrown vegetation and rubbish weren't. Instead all I saw was mowed lawns and nothing more. It turned out that this local council (and many others like it) have effectively outlawed rubbish on vacant lots and unkempt vegetation. They've decreed that in the name of keeping Australia beautiful, all the old sheets of tin found on vacant lots of land must be gotten rid of and the land "cleaned up." Areas that used to be littered with broken down houses, car wrecks and the like, now resemble golf courses.

The net result—the herps are gone too.

To be continued

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Bull. Chicago Herp. Soc. 40(9):174, 2005

Book Review: *Stewardship of the Spiny Softshell Turtle* by Scott D. Gillingwater 2004. 56 pp. The Upper Thames River Conservation Authority, London, Ontario, Canada

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It would appear that our Canadian friends are well ahead of us regarding turtle conservation. Not only are most of their native species protected now, but conservationists in Canada recognize the importance of public sector participation for long term species protection and management. It is an uplifting pleasure to be reviewing this guide, and it makes me hopeful that someday our country's regulatory agencies will finally recognize that they are unable to resolve complex conservation issues by themselves. This continued approach has led to what is at best limited success for most species under their management. In our country funds are spent on research and squandered on overhead, but seldom do populations actually benefit.

In addition to protective legislation (maximum fines of $25,000 to $100,000 and imprisonment for violations of the 1997 Fish and Wildlife Conservation Act in Ontario) Canada has assembled recovery teams for many of their species of conservation concern. These teams not only develop peer-reviewed recovery plans but the teams initiate collaborative research, education and local stewardship programs for each species. The guide reviewed here was written with the knowledge that there is a lot that private sector folks can do to help the recovery process for Ontario's population of spiny softshell turtles.

After a well thought out introduction the guide covers the following topics: the appearance, behavior and biology of the spiny softshell turtle, a chapter on ten/eleven additional species of turtles native to Ontario as well as the introduced red-eared slider, a discussion of the various aquatic/geographic systems of Ontario as they relate to the small isolated populations of this softshell, a list of factors threatening the turtle's survival, recovery actions and stewardship requirements. In addition, there is also information on current research and recovery efforts, legislation and policy, information contacts, a glossary, and appropriate references. The guide is well laid out and includes numerous color photographs. If you get a copy don't overlook the awe inspiring conservation and "let's get it done" quotes almost subliminally nestled throughout the text. They are from sources as diverse as Thomas Jefferson, Aldo Leopold and Martin Luther King. The attitude of the publication is expressed by a quote from Margaret Mead: "Never doubt that a small group of thoughtful, committed citizens can change the world, indeed, it's the only thing that ever has."

The focus of the guide is of course stewardship of the turtle. After reviewing the usual cast of threats including, habitat loss, habitat alteration (dams, dikes, riprap and other erosion control techniques) pollution, predation from subsidized predators, commercial hunting and encounters with boats and fishing-hooks, the author discusses stewardship. This is more than a checklist of dos and don'ts; it organizes the practical things various local people can do to help. For homeowners within the watersheds there are guidelines for the disposal of chemicals and application of pesticides. There is also advice for responsible people who want pet turtles. Owners of agricultural land are made aware of problems resulting from unfenced grazing, wastewater runoff, erosion, and land use. For landowners living adjacent to softshell habitat there are practical suggestions for creating and improving habitat, and for all people using the watersheds there are common-sense ideas for fishing and boating, trail use, the use of off-road vehicles, river clean-up programs, reporting violations, reporting sighting of softshells, and ways to discourage subsidizing their predators. In another section of the guide there is specific information as to where to report wildlife poaching and environmental misuse as well as sources to contact for information on habitat improvement.

While this guide focuses on a specific turtle, the reality of the situation is that good stewardship for almost any species will positively affect most of the associated native species sharing their habitat. In this case the suggestions presented will help a number of lakes and river systems in southern Ontario and their associated biota. We need to move past the point that conservation interest in turtles and other wildlife are solely the responsibility of regulatory agencies and recognize that interest is not just limited to ardent academic professionals. The author makes the point that funding for research and conservation has not been available at the same levels it has for birds and mammals, and that this is due partly to public perception and the lack of programs that bring these species into public awareness. Educational guides such as this one will do much to alleviate this problem. The Ontario Spiny Softshell Recovery Team is doing what most other recovery efforts fail to do—they are soliciting the involvement of local land owners, and people who use the aquatic systems inhabited by these turtles. Public education and involvement in conservation efforts is the only hope for long-term survival for any number of species. The time is here! We should all look forward to seeing similar stewardship guides for other turtles with defined conservation needs.

The point of the guide, in fact the driving point of all conservation, can be found in one of the subliminal quotes buried at the bottom of page 29: "Without habitat, there is no wildlife. It's that simple" – Wildlife Habitat Canada. Without correcting the issues that are putting species in decline individual species management programs are doomed to failure. Game biologists have understood this for decades, yet for some reason most U.S. agencies overseeing reptiles and amphibians of conservation concern fail to understand this. Perhaps this well-thought-out guide is a sign of good things to come.

Bull. Chicago Herp. Soc. 40(9):175-177, 2005

HerPET-POURRI
by Ellin Beltz

I'm Looking Through You

A loggerhead turtle went through airport security while KSTP-TV of Minneapolis, Minnesota, ran film. You can see video at http://www.kstp.com/article/stories/S9828.html?cat=1. The turtle looks suitably bored. It was on its way to "Florida, where it was illegally taken from a beach as a baby last September. An agent with the U.S. Fish and Wildlife Service will accompany the seven-pound turtle. The turtle will be placed at the Conservancy of Southwest Florida, a nature center close to Sanibel Island, until it is large enough to be released into the wild. Loggerhead turtles grow to about 350 pounds. The turtle has been at the Minnesota Zoo since it was confiscated by wildlife agents when it was a week old. The zoo couldn't keep the turtle indefinitely because regulations require that all healthy loggerhead turtles be released into the wild. Only one in 1,000 sea turtle hatchlings make it to adulthood." [KSTP-TV, August 10, 2005, from several folks with email. First arrival: Teri Radke]

Brilliant writing (puns intended)

Natalie Angier of the *New York Times*, pulled out all stops with her review of a paper from the *Proceedings of the National Academy of Sciences*: "Among frogs and New Yorkers alike, those wearing loud colors are assumed to have very poor taste. As researchers have long observed, the brightest frog species in nature are often the most poisonous, and for good reason. Why else would a creature coveted by everything from snakes to birds evolve an extravagantly colored skin, except to warn any would-be predators of bitter toxins embedded therein? Now it turns out that it is no mean feat for a frog to earn its mean feet, and that one of the surest routes to optimal toxicity is through a highly specialized form of ant eating. . . . Through entirely independent pathways, it seems, the two unrelated groups of frogs evolved a similar capacity to store, or sequester, the ingested alkaloids in their skin sacs without being harmed by the pungent substances themselves. And once the unrelated amphibian clans had succeeded in caching the ant bane in their glands, they autonomously evolved bright coloration to broadcast to potential frog-eaters their possession of distasteful alkaloids. . . . The power of convergent evolution has fascinated naturalists from Charles Darwin onward, and it helps explain the appearance of the many aesthetic and functional deja-vus that abound throughout nature: the sleekly hydrodynamic silhouettes of sharks and dolphins, the spindly wings of bats, birds and pterosaurs. As evolutionary biologists see it, the underlying principle of evolutionary convergence—that often there is one right tool for the job, and that selective pressures will reinvent the bio-utensil whenever the need arises—exemplifies just how nonrandom and ostensibly purposeful natural selection can be, and how readily it may be mistaken for evidence of supernatural 'design.' In the case of poison frogs, specific palettes and patterns seem to be so useful for warning off predators that they pop up again and again. On both continents can be found frogs of pure bold Velveeta gold, frogs with glaring spots of red on black." [August 9, 2005, Convergent evolution of chemical defense in poison frogs and arthropod prey between Madagascar and the Neotropics. Valerie C. Clark, Christopher J. Raxworthy, Valerie Rakotomalala, Petra Sierwald, and Brian L. Fisher. Proc. Natl. Acad. Sci. USA published 8 August 2005, 10.1073/pnas.0503502102]

Deadlier than a serpent's tooth

The University of Pittsburgh, Pennsylvania, reports that one of their researchers has found that "Roundup®, the most commonly used herbicide in the world, is deadly to tadpoles at lower concentrations than previously tested; that the presence of soil does not mitigate the chemical's effects; and that the product kills frogs in addition to tadpoles. . . . In two articles published in the August 1 issue of the journal *Ecological Applications*, . . . [researchers] found that even when applied at concentrations that are one-third of the maximum concentrations expected in nature, Roundup® still killed up to 71 percent of tadpoles raised in outdoor tanks. . . . After exposure to the maximum concentration expected in nature, nearly all of the tadpoles from three species died. Although Roundup® is not approved for use in water, scientists have found that the herbicide can wind up in small wetlands where tadpoles live due to inadvertent spraying during the application of Roundup®. Studying how Roundup® affected frogs after metamorphosis, [they] found that the recommended application of Roundup® Weed and Grass Killer, a formulation marketed to homeowners and gardeners, killed up to 86 percent of terrestrial frogs after only one day. 'The most striking result from the experiments was that a chemical designed to kill plants killed 98 percent of all tadpoles within three weeks and 79 percent of all frogs within one day, . . . wrote [the professor]. Previous studies have determined that it is Roundup's surfactant (polyethoxylated tallowamine, or POEA, an 'inert' ingredient added to make the herbicide penetrate plant leaves) and not the active herbicide (glyphosate) that is lethal to amphibians. This research was funded by the National Science Foundation, [the University of Pittsburg's] McKinley Fund, and the Pennsylvania Academy of Science." [August 24, 2005; http://www.umc.pitt.edu/media/pcc050824/sci3_roundup_2005AUG24.html]

Found down Unda!

"A rare frog species, the southern toadlet, has appeared in a record-breaking frog census in Melbourne [Australia] for the first time. . . . The discovery was a highlight of the survey, which involved 900 volunteers collecting information on frogs across Melbourne—the largest number of participants so far. 'The Census also discovered the endangered growling grass frog in two new locations—Caroline Springs and Rockbank,' [the Minister of Water] said. 'These are very important discoveries. Frogs are great indicators of the health of our rivers, creeks, and wetland environments.' But while the survey delivered plenty of good news, the census also recorded an interstate species that could threaten local frogs. . . . "Unfortunately we've also found more populations of the eastern dwarf treefrog, also known as the banana box frog, which comes from interstate and poses a threat to Victorian native frogs,' . . . through disease or competition. . . . Go to http://www.

melbournewater.com.au/frogs for a full list of the frogs recorded in the census and their locations." [August 18, 2005, http://www.theage.com.au/news/national/ribbiting-news-for-frog-lovers/2005/08/18/1123958169092.html]

Invading a Town Near You!

On August 15, 2005, the Associated Press reported: "Thousands of quarter-sized toads have invaded . . . [Big Sandy, a] north-central Montana farming community, causing slippery streets and raising the entrepreneurial spirits of some. The toads started showing up in the southeast portion of town in the past couple of weeks. 'I have no idea how many thousands of toads are in town,' said [a resident]. 'At times, you just about can't take a step.' [Another local] said some lawns in town are filled with so many toads, it looks like the grass is moving. 'They're pretty cute,' she said, . . . [although] driving in town is a little sticky because the roads are filled with tiny, smashed toads. 'Poor little toads,' she said. 'Everyone keeps running them over. They have nowhere to go.' Some are collecting the toads with plans to sell them to pet stores. Others are talking about trying them out as fish bait. . . . [The] chief of the volunteer fire department said the toads seem to be migrating from east to west and believes they will soon be on their way. It was just two years ago that the town's streets were blocked by 10-foot drifts of tumbleweeds. Firefighters hauled the tumbleweeds away and burned them. 'The tumbleweeds were a hazard,' [the chief] said. 'The toads are just a nuisance.'" [Great Falls *Tribune*, http://www.greatfallstribune.com]

Toadally absent

The whole community turned out in the Australian city of Darwin to search for cane toads after 24 toads were found in the past two months, including 16 at their Botanic Gardens. But only one toad was found in the audit which "coincided with the 70th anniversary of the day cane toads were released in Australia… They have since marched across Australia, killing millions of native animals — from lizards to crocodiles — including in world heritage-listed Kakadu National Park." The local Frog Watch Coordinator said he was both surprised and happy that dozens hadn't been found as feared. [August 19, 2005, http://www.news.com.au/story/0,10117,16312964-1702,00.html]

A reasonably sympathetic trait!

Wild Notebook by Simon Barnes from the *London Times* (online) August 20, 2005: "The other evening, I found a toad in the lav. He melted with rather surprising speed into a corner and pretended he wasn't there. Now you're not supposed to touch toads, because they can put out severe skin irritants and, so I gather, hallucinogens. How did anyone find that out? They are creatures with a low reputation: poisonous (King John may have died from toad poison rather than a surfeit of lampreys), witches' familiars, generally regarded as sinister beasts. But toads have performed a U-turn over the past century: the more we lose our wild beasts, the more affection we have for them. We now rather like the bumbling toads. Intelligent gardeners love them, because they are great eaters of slugs. Their sex-mad lives . . . contributed to their poor reputation: Othello talks madly about 'a cistern for foul toads to knot and gender in.' In mass-mating frenzies, toads will seize anything within range to copulate with. These days, again, sex-mad behaviour is regarded as a reasonably sympathetic trait. I picked my toad up in a cloth: and he at once turned belly-up in a graceful faint like a Victorian maiden, front paws either side of the head. Dead, dead! I put him outside the back door and, smugly delighted that his strategy had fooled me, he hopped off into the night. We build our houses and our cities as fortresses against the wild: and we act as if a visitation from the nonhuman world (Pest! Infestation!) were some kind of disaster. Not so. Doff your hat to your wild visitors, tell them it is pleasure to share a planet with them, and send them on their way." Thank you Simon, for a wonderful view of toads in the newest century!

More clothes, same story

August 21, 2005, the Reuters news service brings this update to a story previously reported here: "Mexican environmentalists said they might tone down posters of scantily clad women aimed at saving endangered turtles after a government panel that promotes women's rights objected. The posters seek to dispel a myth that sea turtle eggs are an aphrodisiac. The panel complained that using suggestive images to raise consciousness, even if it is for a worthy cause, is degrading to women. 'My man doesn't need turtle eggs. Because he knows they don't make him more potent,' says an Argentine model staring at one of the posters. Environmentalists said the southern state of Guerrero had asked them to change the posters following complaints by the National Women's Institute. . . . [Even so] the groups behind the posters would likely issue new posters with models in less suggestive poses. 'We might change them,' he said. 'For the next campaign, I would opt for a famous Mexican actress with more clothes on but with the same message.' Every year, tens of thousands of turtles come ashore to lay their eggs on Mexico's Pacific and Caribbean beaches. Many fall prey to poachers who kill the females, extract the eggs from their wombs and sell them as a supposed aphrodisiac. Earlier this month, poachers chopped to death some 80 protected olive ridley sea turtles for their eggs and left their shells scattered on a Pacific beach in Mexico." [*Financial Express*, August 21, 2005]

Anything for a buck

"Small turtles were being sold at kiosks in Tallahassee's two shopping malls Monday despite a federal ban against their sale. Federal law prohibits the sale of turtles under four inches as pets. Their sale has been banned since 1970 because of concerns that they transmit salmonella, a potentially deadly bacteria. A . . . mall spokeswoman said the lease for the Turtle World kiosk where the turtles were being sold . . . was being terminated this week. . . . [A] Turtle biologist . . . of Tallahassee said Monday he had contacted mall managers about the turtle sales. He's concerned the red-eared turtles have been released into the wild and will harm native turtles. . . . [He and another biologist] are filing a petition with the state to ban the sale of any red-eared turtles, which live primarily in the Mississippi River valley and as close to Florida as Alabama. They are related to the yellow-bellied slider, which lives in Florida. Once released in Florida, they can breed with the yellow-bel-

lied slider to create a hybrid. . . . Red-eared turtles also grow larger than the yellow-bellied slider and can out-compete them for food and basking areas on logs, he said." [Sarasota *Herald Today*, August 25, 2005]

Turtles, turtles and more turtles

Political pundit Paul Campos wrote: An old philosophical joke goes like this: The student asks the great sage, "O Master, upon what does the Earth rest?" The sage replies, "O seeker of knowledge, the Earth rests on the back of an enormous turtle." The student then asks, "Tell me, Wise One, upon what does this turtle rest?" The sage answers with annoyance, "Well obviously it's turtles all the way down!" The predictable brouhaha that erupted when President Bush suggested that intelligent design theory ought to be presented to public school students as an alternative to Darwinian evolution revealed, among other things, that a lot of people don't get this joke. [August 9, 2005]

Mercury Retrograde

California is just different than Chicago. Recently a friend of mine who is a well-known astrologer called me. He said, "I just finished your chart and I have to tell you to be very careful. Mercury is going retrograde and it's going to turn your world upside down." What ho, I thought. How can the movement of little spots of light oh, so far away have the slightest effect on us down here? And I still don't believe it, but have had the worst streak of "bad luck" imaginable, starting the day after his call and ending right when he predicted it on the 19th of August! I got majorly sick. Details unnecessary, but bed rest for 14 days killed my last column and a sudden change from cable modem to DSL wiped out my email just about simultaneously. Next month clippings! And please send more as the file is still rather thin despite the best efforts of several wonderful contributors. . . . Send whole pages of newspaper with the date/ publication slugs attached to: Ellin Beltz, POB 1125, Ferndale, CA 95536.

Next time you surf the WorldWide Web, crawl, run, slither, slide, jump, or hop over to the CHS web site!

www.chicagoherp.org

You'll find:

- **Announcements**
- **CHS animal adoption service**
- **CHS events calendar & information**
- **Herp news**
- **Herp links**
- **Meeting/guest speaker information**
- **Photos of Illinois amphibians & reptiles**
- **Much, much more!**

Chicagoherp.org is accepting applications for banner advertisements or links from herpetoculturists and manufacturers of herp-related products. Visit the site and contact the webmaster for details on how you can sponsor CHS!

Herpetology 2005

In this column the editorial staff presents short abstracts of herpetological articles we have found of interest. This is not an attempt to summarize all of the research papers being published; it is an attempt to increase the reader's awareness of what herpetologists have been doing and publishing. The editor assumes full responsibility for any errors or misleading statements.

CONSERVATION OF THE ANEGADA IGUANA

K. A. Bradley and G. P. Gerber [2005, Iguana 12(2):79-85] report that the long-term survival of the Anegada iguana (*Cyclura pinguis*) is uncertain. The species is in danger of becoming extinct due to habitat destruction, competition with feral livestock, and the introduction of non-native mammalian predators. In an effort to save the Anegada iguana, the IUCN Iguana Specialist Group and the British Virgin Islands National Parks Trust began a concerted conservation effort in 1997. They initiated a headstart program in order to bolster the wild population until many of the problems facing the iguanas can be minimized or removed. Headstarted iguanas were released back into the wild in October of 2003 and 2004. This paper briefly reviews the natural history of *C. pinguis* and presents some preliminary results from the ongoing long-term monitoring of the subadult iguanas reintroduced to the wild.

NIGHT ADDERS

J. B. Rasmussen [2005, African J. Herpetology 54(1):1-15] reports that an examination of material of *Causus bilineatus* Boulenger 1905 and of its sympatric congeners from south central Africa confirms its distinctness. Comparisons of allopatric populations of *C. bilineatus* indicate that the variation in number of ventral and subcaudal scutes is limited and represents clines rather than splits between taxa, i.e., *C. lineatus* Laurent is considered a synonym of the monotypic *C. bilineatus* as earlier proposed. Characters are presented to help with identification. A key to the genus and distribution maps of the six recognized species are included.

SPOTTED TURTLE POPULATION STABILITY

S. A. Siess and D. S. Lee [2005, Technical Symposium and Workshop: Threatened, Endangered and At-risk Species on DoD and Adjacent Lands, Baltimore, Maryland] reported that a current study of an insular population of spotted turtles in the upper reaches of the Chesapeake Bay shows spotted turtles to be long-lived. Because the study site is part of military base, the 800-acre area has been off limits to the public, and its wetlands have been protected since at least the 1960s. Mark–recapture studies of spotted turtles were conducted in the 1970s to examine the effects of test chemical warfare agents on the site's fauna. Over 1,500 spotted turtles were marked and released between 1970 and 1982. From 2004 to present researchers reexamined the spotted turtle population at this site and found that at least 50% of the current population is composed of turtles that were present as adults in the mid-1970s. It is reasonable to believe that most of the originally marked turtles are in a 40–60 year age class and some individuals are probably older. Subadults and juveniles make up less than 10% of the total population. Long-term protection of their wetland sites, even when small and localized, would appear to be critical to maintain stable populations of long-lived turtles.

FOUR-LINED SNAKES

E. Filippi et al. [2005, Copeia 2005(3):517-525] compare diets and body sizes in five different habitats for the four-lined snake (*Elaphe quatuorlineata*), one of the largest and more vulnerable snakes species in central Italy. The study includes data both from original field research and from previously published research. Overall, females were significantly larger than males but the strength of these differences varied considerably with sample size. Overall, small mammals accounted for the main part of the diet (66.7%), followed by birds and their eggs (26.4%), and by lizards (6.9%), though the number of eggs in the diet was probably greatly underestimated. In qualitative terms, both sexes fed on the same prey types but, quantitatively, males and females differed significantly in prey composition; females fed on more birds and fewer lizards than males. Rodents were the most important prey source in most habitat types, although birds were preyed upon slightly more frequently in the wet habitat than rodents, which, nonetheless, still represented a important prey source. Four-lined snakes began feeding in early April and continued until early November. Monthly frequency of occurrence of birds in snake stomachs differed significantly from that of small mammals; birds were taken almost exclusively in April and May, and mammals were taken all throughout the annual feeding cycle.

COLOR VARIATION OF TULAROSA BASIN LIZARDS

E. B. Rosenblum [2005, Copeia 2005(3):586-596] attempted to evaluate experimentally the role of phenotypic plasticity in reptile coloration for three lizard species that exhibit dramatic variation in dorsal body darkness associated with different substrates. In New Mexico, blanched color morphs of *Aspidoscelis inornata*, *Holbrookia maculata* and *Sceloporus undulatus* inhabit the gypsum dunes of White Sands, and a melanic form of *S. undulatus* is found on the Carrizozo lava flow. Temperature was manipulated to determine the extent of physiological (rapid) plasticity in coloration for all three species. Color change in response to short-term stimuli did not explain the variation among lizards from different habitats. Although lizards of all color morphs were slightly darker when colder, more melanic lizards displayed a diminished capacity for rapid color change. Common garden experiments were conducted to evaluate the potential for ontogenetic plasticity in coloration for *H. maculata* and *S. undulatus*. Offspring from mothers of different substrate environments were distinguishable by color despite identical developmental conditions. Hatchlings and adults exhibited similar coloration for *H. maculata*, but *S. undulatus* showed an ontogenetic change in coloration. Overall, environmental variation alone did not explain differences in dorsal coloration among lizards from distinctive habitats. Results from these experiments support the hypotheses that color morphology in Tularosa Basin lizards has a strong heritable component and that observed variation is likely adaptive.

Unofficial Minutes of the CHS Board Meeting, August 19, 2005

Linda Malawy called the meeting to order at 7:34 P.M. Board members Jim Hoffman and Deb Krohn were absent.

Officers' Reports

Recording Secretary: Melanie Aspan read the minutes of the July 15 board meeting. Corrections were made and the minutes were approved.

Treasurer: Linda Malawy distributed the July income statements in Jim Hoffman's absence.

Membership Secretary: Jennifer Spitzer presented her newly-produced graph and announced a count of 604 members as of August 2005. Linda passed around a suggested banner for the Kingsnake.com membership ad. Sean Bober and Erik Williams volunteered to work with Cindy Rampacek, our Kingsnake.com contact, on this project.

Publications Secretary: Mike Dloogatch reported that he has received the final version of the article and the photographs to accompany it from Jim Murphy for the supplemental *Bulletin* which has been planned.

Sergeant-at-Arms: Ron Humbert reported 44 attendees at this year's Show and Tell meeting.

Committee Reports

Shows: Jenny Vollman announced September 3-4 as Notebaert dates and also mentioned that the first weekend of each month for the rest of 2005 are tentative Notebaert dates pending our new contract. The Cultural Center has asked us to be part of their Halloween festivities on the Saturday before the holiday. Garfield Park will also be holding an event on this date, October 29. It was decided that we should publish a list of businesses which assisted in this year's ReptileFest in the next *Bulletin*.

Library: Steve Sullivan reported that he is working on repairing the wheels on the library cart. He also mentioned that the Bowtie Publications series on herps may be the next addition to the library. Linda donated a plethora of children's books to the library and Gary Fogel mentioned an unused library cart at his home.

General Meetings: Herp of the month for September will be tri-colored snakes and October will be herps with an orange and/or black color scheme. September's short presentation on an Illinois herp will be on the garter snake and will be presented by Ron Humbert.

Conservation: Linda Malawy presented the board with a proposal to help financially with sending Mike Dreslik, a graduate student working on the Carlyle Lake Massasauga project, to an upcoming symposium in Toronto. Having been approached to donate an item to a raffle to benefit the Grand Cayman Blue Rock Iguana at this year's North American Reptile Breeders' Conference, a year's free membership has been submitted. Erik Williams presented details of a fund-raiser he is sponsoring for the Cryptobranchid Interest Group. Erik will be hosting a one-night sushi class on November 10.

Old Business

State Reptile/Amphibian: Ron Humbert reported that the bill has been signed by Governor Blagojevich and will officially go into effect January 1, 2006.

2005 Trip to Big Sand Mounds: The plan in place is to meet at 9:00 A.M. at the facility on September 10. A map and directions will be emailed to all interested parties and hard copies will be available at the August general meeting.

Paypal: It was noted that our account is in place and the next step seems to be designing a web page to make this useful.

Exchange publications stored at Gary Fogel's home: September 6 was named as moving day with a September 7 backup.

Membership Survey: This item is in production and will be handed out at upcoming meetings and will be available for wider distribution if needed.

Telephone/Voicemail Situation: It has been determined that the 312 telephone number is the number for the CHS voicemail. When the 773 number is called the call is routed to the voicemail served by the 312 number. The 312 number can be maintained without the 773 number, but not vice versa. The eventual dropping of the 773 number off CHS literature was discussed as a precursor for dropping the excess telephone number.

New Business

Midwest Symposium: Linda Malawy presented the dates for this year's Symposium as October 21–23 in Minneapolis. Mike Dloogatch mentioned a conference to be held the same weekend in Nebraska which will cover the topic of snakebites.

2005 Awards: Ron Humbert asked the members-at-large to rally for a short meeting to discuss this item before the start of the August general meeting.

Ideas and Suggestions

Mike Scott suggested that show guidelines should perhaps be published in the *Bulletin* to help promote participation by members.

Roundtable

Jennifer Spitzer noted that a check has been received from the Field Museum to reimburse us for our parking expenses for the 2004 Members' Night.

The meeting was adjourned at 10:04 P.M.

Respectfully submitted by Melanie Aspan, Recording Secretary.

Advertisements

For sale: rats and mice—pinkies, fuzzies and adults. Quantity discounts. Please send a SASE for pricelist or call Bill Brant, *THE GOURMET RODENT*, 6115 SW 137th Avenue, Archer FL 32618, (352) 495-9024, E-mail: GrmtRodent@aol.com.

For sale: from **The Mouse Factory**, producing superior quality, frozen feeder mice and rats. We feed our colony a nutrtionally balanced diet of rodent chow, formulated especially for us, and four types of natural whole grains and seeds. Mice starting from: pinks, $.17 each; fuzzies, $.24 each; hoppers, $.30 each; weanling, $.42; adult, $.48. Rats: starting with pinks at $.45 each, to XL at $1.80 each. Discount prices available. We accept Visa, MC, Discover or money orders. PO Box 85, Alpine TX 79831. Call **toll-free** at (800) 720-0076 or visit our website: < http://www.themousefactory.com> .

For sale: **high quality frozen feeders**. Over a decade of production and supply. Seven sizes of mice availabe: small newborn pinks up to jumbo adults. Prices start at $25 per 100. Feeders are separate in the resealable bag, not frozen together. Low shipping rates. Free price list. Kelly Haller, 4236 SE 25th Street, Topeka KS 66605, (913) 234-3358 evenings and weekends.

For sale: books. *A Check List of North American Amphibians and Reptiles* by Karl P. Schmidt, 6th edition, 1953, published by the American Society of Ichthyologists and Herpetologists, 280 pp., synonymy, scientific name including subspecies, range, bookplate inside front cover, hardbound, $10; *Snakes & Lizards of Australia* by David McPhee, 2nd ed., 1963, 125 pp., many b&w photos, some pages wrinkled due to moisture, small pocket book, softbound, $26; *Natural History of Snakes* by H. W. Parker, 1965, 95 pp., 18 figs., 6 b&w plates, published by British Museum, topics such as nutrition, reproduction, growth and development, softbound $8; *The British Amphibians and Reptiles* by Malcolm Smith, 5th ed., 1973, 322 pp., 91 figs., 16 plates (color and b&w), DJ with plastic cover, hardbound, a detailed natural history of the British hepetofauna by this noted herpetologist, $25; *Mammals of the Pacific World* by T. D. Carter, J. E. Hill and G. H. H. Tate, 1945, 227 pp., 69 figs, DJ torn and part missing, hardbound, $8. $2.50 postage and handling for orders under $25, free for $25 and over. William R. Turner, 7395 S Downing Circle W, Littleton, CO 80122, (303) 795-5128, e-mail: toursbyturner@aol.com.

For sale: c.b. blue-tongued skinks, *Tiliqua scincoides*, born August 2004, $70 each. Linda Malawy, (630) 717-9955.

For sale: **Locale specific reticulated pythons**, c.b.b, Bali Island yellowhead retics, second clutch of offspring produced from my LTC adults. A smaller insular form, an "almost dwarf" if you will. Average adult lengths: (♀)13– 14′; (♂)8– 10′. Eating adult mice/rat crawlers, $225. Also: Nonlocale "Howe" yellowhead retics, c.b.b., my bloodline, known for brilliant lemon yellow heads. A top of the line yellowhead bloodline; bred for coloration and pattern, this is a standard sized retic, eating large adult mice/weanling rats, $150. Photos available of offspring and parents from either bloodline. Shipping available. Please contact Notah Howe with any questions or to purchase. Email: nhherp@yahoo.com.

For sale: c.b. '03 yellow anacondas, aggressive feeders, perfect health, about 2' long, $100 each; also c.b. '04 reticulated pythons; beautiful hatchlings already feeding on adult mice. These guys are tiger siblings and are available for $100/each as well. Personal checks, money orders and Paypal accepted. Out of state shipping available. If you have questions or would like to purchase an animal call Mark Petros, (847) 836-9426 or E-mail ballpython777@yahoo.com.

Herp Tours: Why pay more? Travel with the International Fauna Society, a 501 (c)3 not-for-profit organization, and experience the Costa Rican rainforest! Stay at the beautiful Esquinas Rainforest Lodge in the untouched herpetological paradise that is Piedras Blancas National Park. Meet new friends, relax in the naturally-filtered swimming pool or in the lush, fauna-filled tropical garden. Discounts for IFS and Chicago Herp Society members. For details, visit The International Fauna Society website at www.faunasociety.org or E-mail: info@faunasociety.org.

Herp tours: Adventure trips to **Madagascar**! Journey somewhere truly unique to seek and photograph nature on the world's least-studied mini-continent. For maximum herp fun and discovery, join Bill Love as we go where few people will ever venture in their lives. Let his experience assure a comfortable tour finding the most colorful and bizarre species on the planet! Get all the details at Blue Chameleon Ventures' comprehensive new website: < http://www.bluechameleon.org> , E-mail: bill@bluechameleon.org, or call (239) 728-2390.

Herp tours: The beautiful Amazon! Costa Rica from Atlantic to Pacific! Esquinas Rainforest Lodge, the Osa Peninsula, Santa Rosa National Park, and a host of other great places to find herps and relax. Remember, you get what you pay for, so go with the best! GreenTracks, Inc. offers the finest from wildlife tours to adventure travel, led by internationally acclaimed herpers and naturalists. Visit our website < http://www.greentracks.com> or call (800) 892-1035, e-mail: info@greentracks.com

Virtual Museum of Natural History at www.curator.org: Free quality information on animals—emphasis on herps—plus expedition reports, book reviews and links to solid information. Always open, always free.

Wanted: Volunteer to help with midwestfrogs.com web site by transcribing videotaped interviews with frog biologists (from VHS). Dave McGowan, dmcgowan3@earthlink.net.

Wanted: Female ball pythons, adults preferred but smaller animals also considered. I am a professional breeder specializing in ball pythons and I can assure you that your animal will be provided with excellent care and optimal living conditions. Mark Petros, (847) 836-9426; ballpython777@yahoo.com.

Wanted: I'm looking for my soulmate. I want to settle down to a family before it is too late. But I have this problem. . . . When we get into hobbies and interests: old popular records, jazz and show tunes, and antique electronics are fine, but when I mention turtles, "What, are you crazy?" So maybe this is a better place to look. Please don't try to separate me from my turtles—at least not most of them. If interested, please drop a line to Ellis Jones, 1000 Dell, Northbrook IL 60062, telling a bit about yourself and giving a phone number.

Line ads in this publication are run free for CHS members—$2 per line for nonmembers. Any ad may be refused at the discretion of the Editor. Submit ads to: Michael Dloogatch, 6048 N. Lawndale Avenue, Chicago IL 60659, (773) 588-0728 evening telephone, (312) 782-2868 fax, E-mail: MADadder0@aol.com.

UPCOMING MEETINGS

The next meeting of the Chicago Herpetological Society will be held at 7:30 P.M., Wednesday, September 28, at the Peggy Notebaert Nature Museum, Cannon Drive and Fullerton Parkway, in Chicago. **Roger Repp**, a naturalist and rabid avocational field herpetologist from Tucson, Arizona, will present "Arizona Herpetological Potpourri: The Last 35 mm Slide Show?" Roger will spurn the use of PowerPoint, maps and charts, and instead use the best slides of 25 different herpetographers to demonstrate cryptic coloration, color polymorphism, color ontogeny, and natural history of the herpetofauna of Arizona. Roger will take us from sandy dune country to forested peaks, and include in situ shots of wild herps captured in incredible behaviors. There will be something for all herp lovers in this program.

At the October 26 meeting, **Tom Johnson**, author of *The Amphibians and Reptiles of Missouri* and former State Herpetologist for Missouri, will speak to us about his ten favorite Missouri herps.

The regular monthly meetings of the Chicago Herpetological Society take place at Chicago's newest museum — the **Peggy Notebaert Nature Museum**. This beautiful new building is at Fullerton Parkway and Cannon Drive, directly across Fullerton from the Lincoln Park Zoo. Meetings are held the last Wednesday of each month, from 7:30 P.M. through 9:30 P.M. Parking is free on Cannon Drive. A plethora of CTA buses stop nearby.

Board of Directors Meeting

Are you interested in how the decisions are made that determine how the Chicago Herpetological Society runs? And would you like to have input into those decisions? If so, mark your calendar for the October 14 board meeting, to be held at the North Park Village Administration Building, 5801 North Pulaski Road, Chicago. To get there take the Edens Expressway, I-94, and exit at Peterson eastbound. Go a mile east to Pulaski, turn right and go south to the first traffic light. Turn left at the light into the North Park Village complex. At the entrance is a stop sign and a guardhouse. When you come to a second stop sign, the administration building is the large building ahead and to your left. There is a free parking lot to the left and behind the building.

The Chicago Turtle Club

The monthly meetings of the Chicago Turtle Club are informal; questions, children and animals are welcome. Meetings normally take place at the North Park Village Nature Center, 5801 N. Pulaski, in Chicago. Parking is free. For more info call Lisa Koester, (773) 508-0034, or visit the CTC website: http://www.geocities.com/~chicagoturtle.

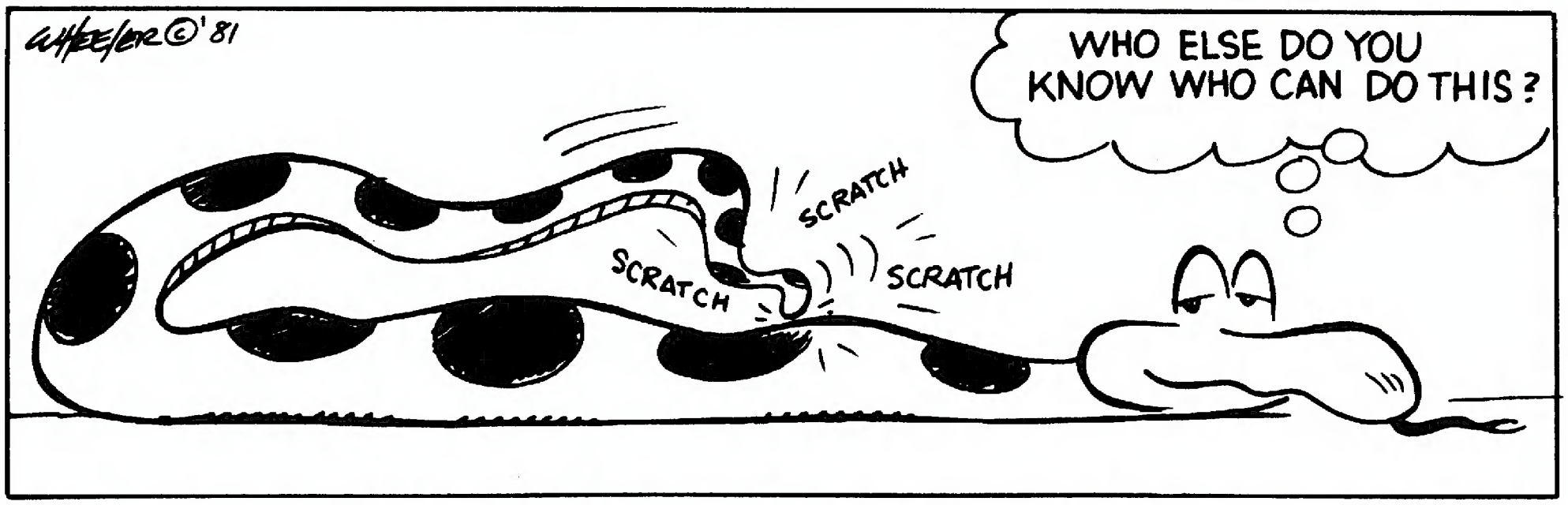
A BELATED THANK-YOU

As I prepare to pass the torch to the new ReptileFest Chair, Jenny Vollman, I realize that I never publicly thanked several important members of our community who went the extra mile to promote ReptileFest 2005. I thank Sandy Quinn and the staffs of *Reptiles* magazine and BowTie, Inc., for help with advertising as well as valuable advice and support, Cindy Rampacek and her colleagues at Kingsnake.com for the extensive advertising on their site, and Kathy Miceli and the staff of Plants Inc. for providing all of the live greenery that gave 'Fest such a nice atmosphere. Thanks to these groups and all of our supporters. We hope to see you again at ReptileFest 2006. **Steven M. Sullivan**

HERP OF THE MONTH

Each monthly meeting will showcase a different herp. CHS members are urged to bring one specimen of the "Herp of the Month" to be judged against the entries from other CHS members. Prizes will be awarded to the top three winners as follows: 1st place—6 raffle tickets at next meeting; 2nd place—4 raffle tickets at next meeting; 3rd place—2 raffle tickets at next meeting. Categories for the next two meetings are: September—tricolor milk- or kingsnakes; October—any herp with orange & black colors.

THE ADVENTURES OF SPOT



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